CLAIMS

What is claimed is:

1. A system for converting sensed force or mechanical motion into corresponding electrical signals, comprising:

a sensor providing an electrical signal as a function of sensed force or mechanical motion;

an electronic circuit (i) electrically coupled to the sensor to receive the electrical signal as an input and (ii) including at least two filters to filter the received electrical signal and provide respective corresponding electrical signals as outputs.

2. The system as claimed in Claim 1, wherein said at least two filters include a low-pass filter and a high-pass filter.

3. The system as claimed in Claim 2, wherein the low-pass filter passes frequencies in the linear region of the sensor and the high-pass filter passes the resonance frequency of the sensor.

4. The system as claimed in Claim 1, wherein said at least two filters filter and amplify the electrical signal.

5. The system as claimed in Claim 1, wherein said at least two filters filter, amplify, and offset the electrical signal.

6. The system as claimed in Claim 1, wherein inputs to said at least two filters are electrically isolated from one another.

7. The system as claimed in Claim 1, wherein the electronic circuit further includes a buffer to isolate the inputs of said at least two filters from one another.

8. The system as claimed in Claim 7, wherein the buffer is electrically disposed between the sensor and at least one of the filters.

9. The system as claimed in Claim 8, further including at least one impedance element to provide the output electrical characteristics of the sensor to filters not coupled directly to the sensor.

10. The system as claimed in Claim 7, wherein the buffer is arranged in a source follower configuration.

11. The system as claimed in Claim 7, wherein the buffer employs an operational amplifier.

12. The system as claimed in Claim 7, wherein one of the filters is a low pass filter and power is supplied to the buffer by the output of the low pass filter.

13. The system as claimed in Claim 1, wherein the filters have high input impedance.

14. The system as claimed in Claim 1, wherein the filters use a JFET transistor to amplify the electrical signal.

15. The system as claimed in Claim 1, wherein the filters use at least one JFET transistor to decrease temperature dependence of characteristics of the filters.

16. The system as claimed in Claim 1, wherein the filters have low output impedance.

17. The system as claimed in Claim 1, wherein the filters use at least one transistor to provide low output impedance.

18. The system as claimed in Claim 1, wherein the filters use a Darlington combination of transistors to provide low output impedance.

19. The system as claimed in Claim 1, wherein the filters use a Darlington transistor to provide low output impedance.

20. The system as claimed in Claim 1, wherein the filters include a passive low-pass filter circuit.

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21. The system as claimed in Claim 1, wherein the filters include a passive high-pass filter circuit.

22. The system as claimed in Claim 1, wherein the sensor is a piezoelectric sensor.

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23. A method for converting sensed force or mechanical motion into corresponding electrical signals, comprising:

providing an electrical signal as a function of sensed force or mechanical motion;

filtering the electrical signal into at least a first frequency band and a second frequency band; and

outputting the electrical signal in the first frequency band and the second frequency band independently.

24. The method as claimed in Claim 23, wherein said filtering the electrical signal includes low-pass filtering the electrical signal.

25. The method as claimed in Claim 23, wherein said filtering the electrical signal includes high-pass filtering the electrical signal.

26. The method as claimed in Claim 23, wherein said filtering the electrical signal includes filtering and amplifying the electrical signal.

27. The method as claimed in Claim 23, wherein said filtering the electrical signal includes filtering, amplifying, and offsetting the electrical signal.

28. The method as claimed in Claim 23, further including isolating the electrical signal in a manner allowing for independent filtering of the first and second frequency bands.

29. The method as claimed in Claim 28, wherein said isolating includes buffering the electrical signal.

30. The method as claimed in Claim 29, further including conditioning the electrical signal prior to filtering the electrical signal into at least one of the frequency bands.

31. The method as claimed in Claim 29, further including employing a single power source to provide power for the buffering.

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32. The method as claimed in Claim 23, wherein said filtering the electrical signal includes high-impedance sensing the electrical signal.

33. The method as claimed in Claim 23, wherein said filtering the electrical signal includes decreasing temperature sensitivity.

34. The method as claimed in Claim 23, wherein said outputting the electrical signal includes providing the electrical signal in said at least first and second frequency bands with a low output impedance.

35. The method as claimed in Claim 23, wherein said filtering the electrical signal includes passive low-pass filtering.

36. The method as claimed in Claim 23, wherein said filtering the electrical signal includes passive high-pass filtering.

37. A system for converting sensed force or mechanical motion into corresponding electrical signals, comprising:

means for providing an electrical signal as a function of sensed force or mechanical motion; and

means for converting said electrical signal into at least two filtered signals.

38. An electronic circuit for processing an electrical signal corresponding to a sensed force or mechanical motion, comprising:

a circuit input, to receive an electrical signal corresponding to the sensed force or mechanical motion; and

at least two filter modules coupled to the circuit input to filter the electrical signal and provide respective filtered electrical signals on respective circuit outputs.

39. The electronic circuit as claimed in Claim 38, wherein said at least two filter modules include a low-pass filter.

40. The electronic circuit as claimed in Claim 38, wherein said at least two filter modules include a high-pass filter.

41. The electronic circuit as claimed in Claim 38, wherein said at least two filter modules filter and amplify the electrical signal.

42. The electronic circuit as claimed in Claim 38, wherein said at least two filter modules filter, amplify, and offset the electrical signal.

43. The electronic circuit as claimed in Claim 38, wherein respective inputs of said at least two filter modules are electrically isolated from one another.

44. The electronic circuit as claimed in Claim 38, further including a buffer to isolate respective inputs of said at least two filter modules from one another.

45. The electronic circuit as claimed in Claim 44, wherein said buffer is electrically disposed between said circuit input and at least one of the inputs of said at least two filter modules.

46. The electronic circuit as claimed in Claim 45, further comprising at least one impedance element to provide the electrical characteristics observed by said circuit input to filter modules not coupled directly to said circuit input.

47. The electronic circuit as claimed in Claim 44, wherein said buffer is arranged in a source follower configuration.

48. The electronic circuit as claimed in Claim 44, wherein said buffer employs an operational amplifier.

49. The electronic circuit as claimed in Claim 44, wherein one of said at least two filter modules is a low-pass filter and power is supplied to said buffer by an output of said low-pass filter.

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50. The electronic circuit as claimed in Claim 38, wherein at least one of said at least two filter modules has high input impedance.

51. The electronic circuit as claimed in Claim 38, wherein at least one of said at least two filter modules uses a JFET transistor to amplify the electrical signal.

52. The electronic circuit as claimed in Claim 38, wherein at least one of said at least two filter modules uses at least one JFET transistor to decrease temperature sensitivity of characteristics of the filter module.

53. The electronic circuit as claimed in Claim 38, wherein at least one of said at least two filter modules has low output impedance.

54. The electronic circuit as claimed in Claim 53, wherein at least one of said at least two filter modules uses at least one transistor to provide the low output impedance.

55. The electronic circuit as claimed in Claim 53, wherein at least one of said at least two filter modules uses a Darlington combination of transistors to provide the low output impedance.

56. The electronic circuit as claimed in Claim 38, wherein at least one of said at least two filter modules includes a passive low-pass filter circuit.

57. The electrical circuit as claimed in Claim 38, wherein at least one of said filter modules includes a passive high-pass filter circuit.